Environment and Economic Development

In recent years there has been growing concern about degradation and pollution of environment and climate change as they impact on future development of both the developing and developed countries. In 1992, representatives of over 150 countries met at Rio in Brazil to discuss the environmental issues and their implications for future development of the world. This meeting at Rio is called the 'Earth summit' or the United Nations Conference on Environment and Development (UNCED).

This conference clearly spelled out the linkages between natural environment and development and put forward the concept of "sustainable development". This has produced greater awareness about environmental issues and facilitated the cooperation between different countries to reduce environmental degradation, particularly to reduce emission of greenhouse gases (GHG) such as carbon dioxide to prevent adverse climate change, that is, global warming in future which, if not prevented, will have disastrous consequences for the welfare and development of the population, both in developing and developed countries.

In recent years economists have increasingly become interested in environmental economics which is concerned with how economic activities of producers and consumers affect the environment in which we live and explain the policies to improve the quality of life of the present and future generation. Environmental issues are more important for developing countries where poverty prevails on a large scale and acceleration of economic growth is urgently needed.

The conflict between economic growth and environment is sharper today than ever before, particularly in developing countries like India with fast growing population and mass poverty. The developing countries are making strenuous efforts to balance their need for rapid economic growth with the environmental concerns for keeping their natural base intact. In India, as in other developing countries, the adoption of development strategy based primarily on large-scale industrialisation, energy-intensive technologies and biochemical-based agricultural technology, which ignored indigenous development paradigm based on locally self-sufficient technologies, has led to environmental degradation.

Economy-Environment Linkages (Relations):

Modern economics is not only concerned with financial matters but also with several unpriced services and resources which natural environment provides us. In environmental economics how economic activity and policy affect the environment in which we live and also how environment supports economic activities. It is of great importance to explain how the economy and environment are interlinked. The environment supports economic activity by man in four ways – it provides life support, supplies natural resources for production and consumption, absorbs waste products and supplies amenity services. The economy works from inside the environmental system and its activities affect the environment and the latter also affects the economy.

The economy is a system consisting of producing firms, consumers and the market system where interaction between the producers and consumers takes place. The purpose of economy is to produce goods and services to satisfy consumer wants. For the production of goods and services, the economy uses made-made capital, labour and natural resources (such as coal, oil (petroleum and diesel), CNG gas), minerals and metals, etc. from environment.

There are two types of resources – renewable and non-renewable. The renewable resources such as forests and fisheries are those whose quantity can be increased when they are depleted. For example, when, there is deforestation by cutting trees, new trees can be planted to make up the deficiency. Similarly, new fisheries can be developed. On the other hand, the non-renewable resources are those whose exhaustion as a result of their use cannot be made up. Coal, iron ore, crude oil are examples of non-renewable resources as they cannot be produced by man. They are also called exhaustible resources.

It may be noted that resource inputs are transformed by the economy into outputs. For example, wood through a production process is converted into paper and crude oil is refined to produce petrol.

How the economy is related to the environment is depicted in Fig. 56.1. The environment in Fig. 56.1 is represented by the whole big circle. Note that the environment means all natural resources such as land, ecosystem (i.e., flora and fauna), all mineral and metal deposits under the land surface, world's oceans and atmosphere and natural climate. The economy is shown inside the environment system in which it works. As in the economy the firms produce goods and services with the use of natural resources, man-made capital and labour to satisfy the consumption wants of the households. There are many relations between the environment and the economy.

First, by providing a biological, chemical and physical system that makes it possible for human beings to live, the environment system that includes the air and atmosphere, rivers, the fertility of the soil and biodiversity (i.e., various types of plant and animal life) on which life of households depends. They are essential and necessary for their existence. If there is any large reduction in these conditions provided by the environment system, there will be highly devastating effect on human life. This life-support function of the environment system is shown by the arrow towards the economy in the upper part of Fig. 56.1.

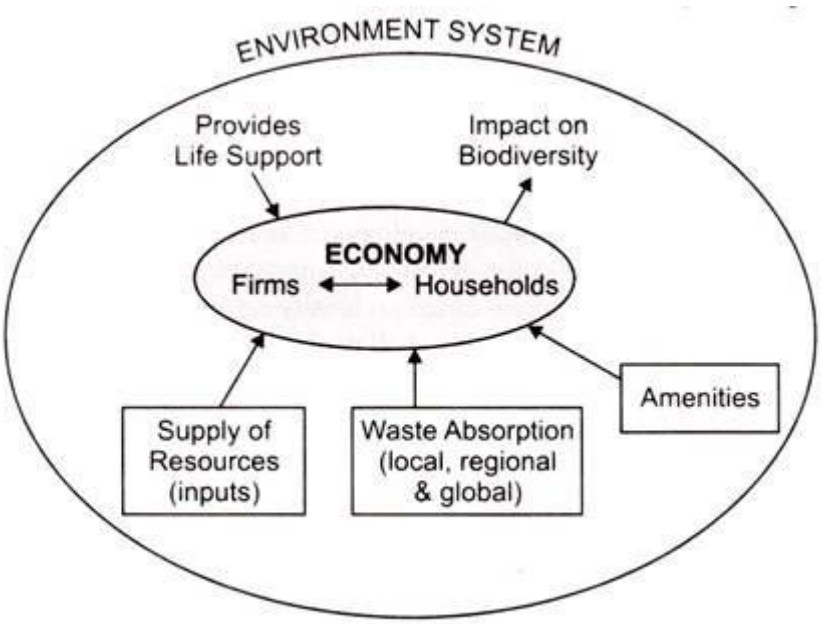

Fig. 56.1. *Economy–environment linkages or relations*

Second, the environment provides raw materials and energy resources such as minerals, metals, food, wood and cotton for production and use by the firms and households in the economy. These natural resources may be renewable or non-renewable. Some non-renewable resources must be preserved for future generations and in this regard efforts should be made to find their man-made substitutes. For example, to save coal, solar energy can be used.

Besides, even renewable resources can be used in a sustainable manner. For example, to ensure deforestation should not result in desertification, new trees be planted to make up the loss of trees. The use of renewable resources is shown in Fig. 56.1 by the opposite flow of resources from the economy to the environment. As regards non-renewable resources such as coal and crude oil, their use causes permanent reduction in their stock.

Third important function of the environment is to absorb the waste products such as carbon dioxide (CO_2) which originate from the production processes of the firms, from power plants or the consumption activities of the households which generate garbage for collection and disposal. Thus, the

environment is used as a waste sink. Wastes may be in a variety of basic forms such as solid, air and water-borne.

It is important to note that environment has a limited assimilative capacity to absorb these wastes or to dispose of them safely, that is, to transform them into some harmless substances. For example, carbon dioxide gas which is responsible for global warming is captured through growth of forests and a part is absorbed by oceans. Deforestation on a large scale and limited ability of oceans to absorb the carbon dioxide has caused the increase in global warming.

In this context, it is worth mentioning that the global warming in the Indian Ocean has disturbed the weather system in the Indian sub-continent and weakened monsoon in India on which a majority of farmers depend for their livelihood, Consequently, it has been suggested that to prevent the rise in global warming carbon dioxide emissions have to be reduced and alternative means of capturing these CO_2 emission have to be followed. Besides, we need to take measures to adapt to climate change. Fourth, the environment provides the people with direct source of amenity services such as natural scenic beauty which give pleasure and happiness to them. The beauty of Kashmir Valley and of parts of Kerala of India is a source of greater happiness and therefore attracts a large number of tourists. These amenity services, though they are not essential for the existence of life, are a source of enjoyment, a sort of luxury for the people.

It may be noted that different parts of the environment system may perform more than one function. For example, “the oceans are important in determining the life-support system provided by the global and microclimates; they are sources of many minerals and other resources; they assimilate many different wastes and they provide the space and opportunity for marine pastimes”.

Further, the functions of environment may be competitive or complementary. For example, the excessive deposit of wastes in the oceans will reduce their capacity to provide habitat for fish stock. Environment functions may be complementary as the forestry policy of planting more trees can ensure sustainable way of reducing soil erosion (promoting a life support function), a source of timber (a function of natural resource supply) and absorbing carbon dioxide from the atmosphere (i.e., a waste absorption function).

From our above analysis, it is evident that the economy has important relations with the environment.

Economic development, especially industrialisation, is associated with the increase in consumption of energy which in the modern times is mostly derived from fossil fuels (petrol, diesel, coal). Before the modern industrial era, we used biomass for cooking and space heating and other economic activities were performed using muscle power of human labour and that of animals reared and domesticated by man for carrying out the various productive activities.

But the industrialisation along with rapid growth of population has necessitated the greater increase in consumption of energy which could no longer be adequately supplied by human and animal muscle power. As a result, to produce goods and services to meet the increasing consumption for them required the use of energy to be derived from fossil fuels. It is worth noting that even electricity is generated with the use of coal in thermal power plants or water in the hydel projects.

It is the energy derived from fossil fuels in the industrial development that creates external diseconomies in the form of pollution of air and water and involves the use of natural resources such as forests, minerals and water. Thus rapid industrialisation in developed countries has resulted in the emission of large-scale carbon dioxide and other greenhouse gases which has adversely affected our environment and created global warming with the disastrous consequences for the future generation.

Mr. Rajendra K. Pachauri who with his team of environmentalists got Nobel Prize writes, “Modern technology and innovation have alleviated the drudgery and distress that humans faced in the past. But in this melee of rapid growth and development, fuelled by increasing consumption of modern fuels, we have also imposed negative externalities on our global commons, particularly on the earth s

atmosphere which has now almost 400 parts per million of carbon dioxide as opposed to 280 million parts in the pre-industrial period."

Further, a key aspect of our economic development in the past is marked by total indifference to the use of key natural resources of the earth. This has led to unsustainable and inefficient increase in the growth of output of goods and services to meet the basic increases in consumption of the present generation at the cost of future generations. If this process of increases in consumption and growth continues, this will end in full exploitation of fossil fuels, the main source of energy today.

When this happens the process of economic development will cease and the economies will reach stagnation. Therefore, there is paramount need for use of renewable energy such as solar energy. To quote Mr. Pachauri again "the natural wealth of the planet and ability to use it for welfare is directly the gift of the sun, a reality that most of us seldom reflect on. We are living in a world where people believe that age of fossil fuels must inevitably come to a close and the future undeniably lies in the widespread use of renewable forms of energy".

In this context it is important to mention the theme of Rio-12 Earth Summit held in June 2012 at Rio which was to suggest measures to achieve the objective of green economy. "A green economy is the one that results in improved human well-being and social equity while significantly reducing environmental risks and ecological scarcities. Growth in a green economy is driven by investments that reduce pressures on the environment and the services it provides us while enhancing the energy and resource efficiency."

While developed countries which experienced unprecedented growth in the last more than a century there are several developing countries where a lot of population live in poverty and misery. It is the developed countries which have contributed most to the present level of environmental pollution and global warming. Therefore, they ought to help the poor developing countries with adequate funds and needed technology transfer and achieve sustainable development.